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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,527	05/01/2001	David Koo	US 010225	4129

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EXAMINER

TRAN, TRANG U

ART UNIT	PAPER NUMBER
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2614

DATE MAILED: 09/03/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/846,527

Applicant(s)

KOO, DAVID

Examiner

Trang U. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8 and 10-21 is/are rejected.
- 7) ☒ Claim(s) 7 and 9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 16 July 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION***Double Patenting***

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 16-21 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 9 of copending Application No. 09/848,061 in view of Limberg et al (US Pub No. 2002/0051087 A1).

Regarding claim 16 of this application, claims 1 and 9 of copending Application No. 09/848,061 recites identifying a plurality of echo cancellation reference signals between the field syncs; processing the digital data stream with the echo cancellation reference signals to provide a substantially echo-free digital data stream; and wherein the echo cancellation reference signals are of a class of signals substantially defined by

$$f(t) = \frac{1}{2\pi} \int_0^{\Omega} [A \cos(b\omega^2) + jA \sin(b\omega^2)] e^{j\omega t} d\omega \\ + \frac{1}{2\pi} \int_{-\Omega}^0 [A \cos(-b\omega^2) + jA \sin(-b\omega^2)] e^{j\omega t} d\omega$$

A, b and Ω being real numbers.

However, claims 1 and 9 of copending Application No. 09/848,061 does not recites the claimed furnishing the substantially echo-free digital data stream to a digital television receiver. Limberg et al teach that the subtractor 34 supplies its difference output signal as the IIR filter output signal, which is supplied as input signal to the rest 39 of DTV receiver per conventional practice (Fig. 5, page 6, [0054]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the DTV receiver as taught by Limberg et al's system in order to initialize the parameters of adaptive filters used in the DTV receivers for channel-equalization and echo-cancellation.

Regarding claim 17, the claimed further comprising removing the echo cancellation reference signals from the substantially echo-free digital data stream subsequent to the processing step and prior to the furnishing step is met by the channel equalization and echo-cancellation 34-38 (Fig. 5, page 6, [0054] and page 13, [0098]-[0100]) of Limberg et al.

Regarding claim 18, the claim wherein the identifying step further comprises identifying the echo cancellation reference assembly signals within a plurality of macro echo cancellation reference assembly signals is met by page 5, [0041] of Limberg et al.

Claim 19 of this application is rejected over claims 1 and 9 of copending Application No. 09/848,061 and Limberg et al for the same reason as discussed in claim 16.

Claim 20 of this application is rejected over claims 1 and 9 of copending Application No. 09/848,061 and Limberg et al for the same reason as discussed in claim 16.

Claim 21 of this application is rejected over claims 1 and 9 of copending Application No. 09/848,061 and Limberg et al for the same reason as discussed in claim 16.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-6, 8, 10-11 and 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Limberg et al (US Pub No. 2002/0051087 A1).

In considering claim 1, Limberg et al. discloses all the claimed subject matter, note 1) the claimed an equalizer having an input for receiving a transmitted digital data stream comprising a plurality of field syncs, a plurality of segments of symbol spaces between successive ones of the field syncs, and a plurality of echo cancellation reference signals between the field syncs, the equalizer operatively processing the digital data stream at the input thereof with the echo cancellation reference signals to

provide a substantially echo-free digital data stream at an output thereof is met by the channel equalization and echo-cancellation 34-38 (Fig. 5, page 6, [0054] and page 13, [0098]-[0100]), and 2) the claimed a digital television receiver having an input coupled to the output of the equalizer is met by the DTV 39 (Fig. 7, page 10, [0081]-[0088]).

In considering claim 2, the claimed wherein the digital data stream at the output of the equalizer includes the echo cancellation reference signals, further comprising a temporary memory coupled to the output of the equalizer for removal of the echo cancellation reference signals from the digital data stream, the digital television receiver being coupled to the output of the equalizer through the temporary memory is met by some DTV receiver designs the means for temporal buffering will also include digital memory configured to introduce FIFO buffering delay into the application of difference output signal from the subtractor 34 to the rest 39 of the DTV receiver (page 13, [0100]).

In considering claim 3, the claimed wherein the transmitted digital data stream is an ATSC VSB digital data stream into which the echo cancellation reference signals are inserted prior to transmission thereof, and the digital television receiver is a standard VSB television receiver is met by the multiplexer 17 (Fig. 4, page 5, [0041] and [0048]).

In considering claim 4, the claimed wherein: at least some of the symbol spaces in the transmitted digital data stream are blank and are functionally related to the echo cancellation reference signals to form macro echo cancellation reference assembly signals, and the digital data stream at the output of the equalizer includes the macro echo cancellation reference assembly signals is met by Fig. 2, page 4, [0037] to page 5, [0048], and the claimed the digital television receiver system further comprising a

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temporary memory coupled to the output of the equalizer for removal of the macro echo cancellation reference assembly signals from the digital data stream, the digital television receiver being coupled to the output of the equalizer through the temporary memory is met by some DTV receiver designs the means for temporal buffering will also include digital memory configured to introduce FIFO buffering delay into the application of difference output signal from the subtractor 34 to the rest 39 of the DTV receiver (page 13, [0100]).

In considering claim 5, the claimed wherein the transmitted digital data stream is an ATSC VSB digital data stream into which the macro echo cancellation reference assembly signals are inserted prior to transmission thereof, and the digital television receiver is a standard VSB television is met by the multiplexer 17 (Fig. 4, page 5, [0041] and [0048]).

In considering claim 6, the claimed wherein: the transmitted digital data stream is an ATSC VSB digital data stream into which the echo cancellation reference signals are inserted prior to transmission thereof; the digital data stream at the input of the receiver includes the echo cancellation reference signals; and the digital television receiver is a VSB television receiver is met by the multiplexer 17 (Fig. 4, page 5, [0041] and [0048]).

In considering claim 8, the claimed wherein: at least some of the symbol spaces in the transmitted digital data stream are blank and are functionally related to the echo cancellation reference signals to form macro echo cancellation reference assembly signals: the digital data stream at the input of the receiver includes the macro echo cancellation reference assembly signals; the transmitted digital data stream is an ATSC

VSF digital data stream into which the macro echo cancellation reference assembly signals are inserted prior to transmission thereof; and the receiver is a VSB television receiver is met by the multiplexer 17 (Fig. 4, page 5, [0041] and [0048]).

In considering claim 10, Limberg et al discloses all the claimed subject matter, note 1) the claimed wherein the equalizer comprises: an extraction circuit for extracting copies of the echo cancellation reference signals from the digital data stream at the input of the equalizer is met by the demodulator and analog-to-digital conversion circuitry 32 supplies digitized baseband DTV signal (Fig. 5, page 6, [0054]), 2) the claimed a microprocessor coupled to the extraction circuit for calculating filter coefficients from the extracted copies of the echo cancellation reference signals is met by the filter coefficient computer 40 (Fig. 5, page 6, [0056]-[0069]), and 3) the claimed a filter receiving the digital data stream from the input of the equalizer coupled to the microprocessor for substantially canceling echo interference from the transmitted digital data stream is met by the FIR filter 33 and the IIR filter 34-38 (Fig. 5, page 6, [0054]-[0069]).

In considering claim 11, the claimed wherein the filter comprises a FIR filter section and an IIR filter section is met by the FIR filter 33 and the IIR filter 34-38 (Fig. 5, page 6, [0054]-[0069]).

In considering claim 14, the claimed wherein successive ones of the field syncs contain therebetween only one echo cancellation reference signal is met by the demodulator and analog-to-digital conversion circuitry 32 supplies digitized baseband DTV signal (Fig. 5, page 6, [0054]) (Fig. 4, page 5, [0041] and [0048]).

In considering claim 15, the claimed wherein successive ones of the field syncs contain therebetween a plurality of echo cancellation reference signals is met by the demodulator and analog-to-digital conversion circuitry 32 supplies digitized baseband DTV signal (Fig. 5, page 6, [0054]) (Fig. 4, page 5, [0041] and [0048]).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Limberg et al (US Pub No. 2002/0051087 A1) in view of Koo et al (US patent No. 5,283,650).

In considering claim 12, Limberg et al disclose all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed wherein: the transmitted digital data stream is transmitted over a transmission path; and the echo cancellation reference signal is non-cyclic, has a substantially flat frequency response within the bandwidth of said transmission path, has a large plurality of amplitude peaks over a time interval, and has proportionally shorter tails relative to the large plurality of amplitude peaks. Koo et al teach that means for deriving from said received reference signal a sequence of coefficients to be used with at least one filter, wherein said reference signal is non-cyclic, has substantially flat frequency response within the bandwidth of said transmission path, has a large plurality of amplitude peaks over a time interval (col. 8, lines 27-40). Therefore, it would have been obvious to one of

ordinary skill in the art at the time of the invention to incorporate the echo cancellation reference signal as taught by Koo et al into Limberg et al's system in order to transmit and process at a receiver, a multiframe sequence of television lines, each field comprising a GCR signal.

Allowable Subject Matter

7. Claims 7 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Patel et al. (US Patent No. 6,480,239 B1) disclose ghost cancellation reference signal with bessel chirps and PN sequences, and TV receiver using such signal.

Matsunaga (US Patent No. 5,973,752) discloses ghost removal apparatus.

Lee (US Patent No. 5,623,318) discloses ghost canceling method and apparatus using canonical signed digit codes.

Greenberg (US Patent No. 5,278,872) discloses system and circuit architecture for echo cancellation and a television receiver comprising same.

Huang (US Patent No. 5,321,512) discloses ghost signal cancellation system using feedforward and feedback filters for television signals.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Trang U. Tran** whose telephone number is **(703) 305-0090**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **John W. Miller**, can be reached at **(703) 305-4795**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231


or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

TT TT
August 22, 2003


MICHAEL H. LEE
PRIMARY EXAMINER